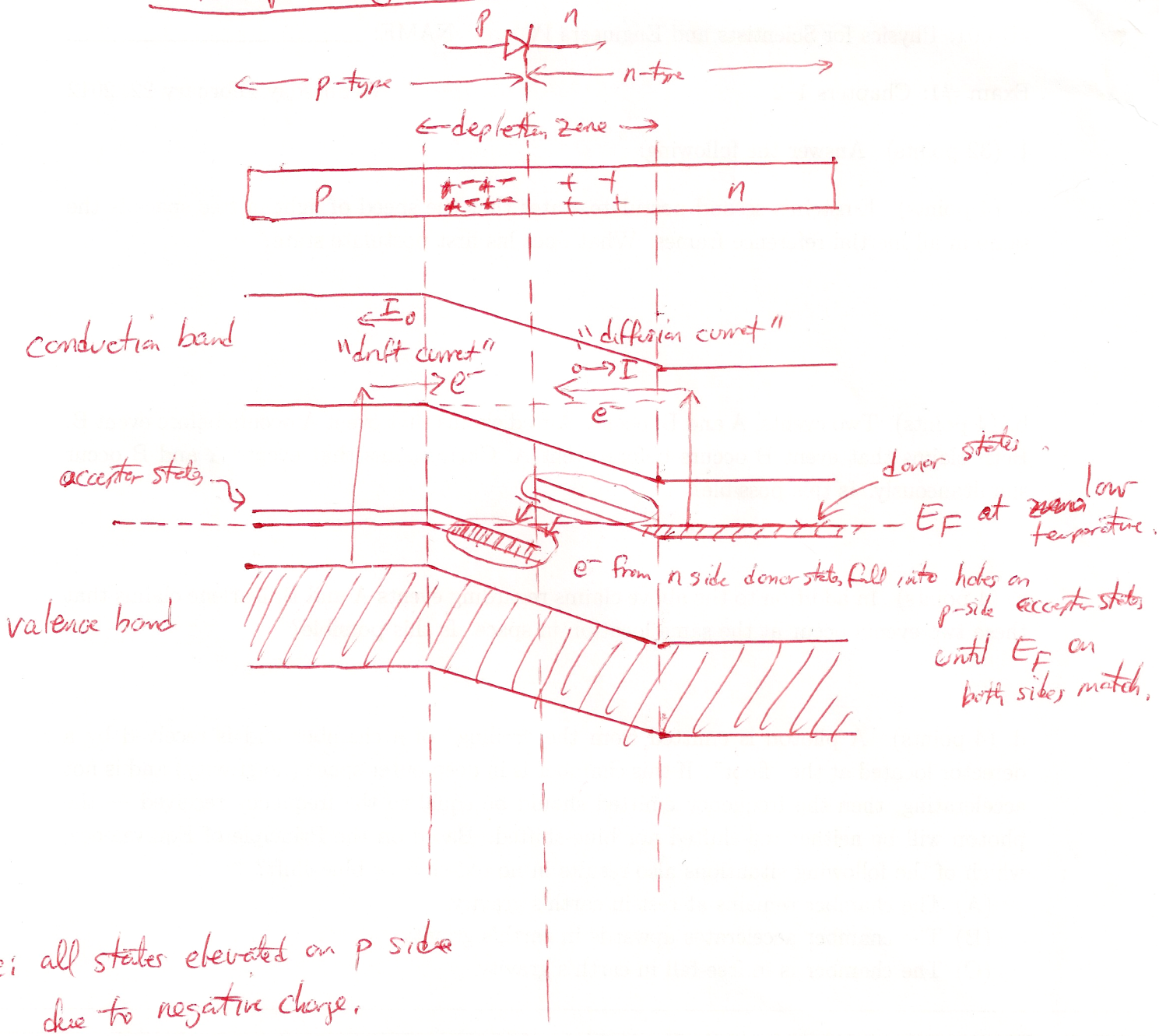
The p-n junction



Note: all states elevated on p side due to negative charge.

Diffusion current depends on potential hill since e^- must climb from donor level (n-side) to conduction band (p-side). Diffusion current decreases (exp to 0) if diode is reverse biased and increases (exp ↑, at least until hill disappears) if diode is forward biased. ↖ at barrier voltage

Drift current does not depend on potential hill since e^- must climb from valence level (p-side) to conduction band (p-side AlGaAlN) before drifting over to n-side.

Equilibrium: diff ← e^- ; e^- drift →

Reverse bias: diff ← e^- ; e^- drift →

Fwd bias: diff ← e^- ; e^- drift →